

ABSTRACT

[0044] A number of materials with the composition $\text{Li}_{1+x}\text{Ni}_\alpha\text{Mn}_\beta\text{Co}_\gamma\text{M}'_\delta\text{O}_{2-z}\text{F}_z$ ($\text{M}' = \text{Mg}, \text{Zn}, \text{Al}, \text{Ga}, \text{B}, \text{Zr}, \text{Ti}$) for use with rechargeable batteries, wherein x is between about 0 and 0.3, α is between about 0.2 and 0.6, β is between about 0.2 and 0.6, γ is between about 0 and 0.3, δ is between about 0 and 0.15, and z is between about 0 and 0.2. Adding the above metal and fluorine dopants affects capacity, impedance, and stability of the layered oxide structure during electrochemical cycling.